material melts down more rapidly in consequence of increased temperature, then up to a certain point, at which guttering begins, the rate of consumption of the candle material will increase. But in these experiments there was no guttering and no smoking of the wick. C. TOMLINSON

Highgate, October 13

Selective Discrimination of Insects

THE remarks of Sir John Lubbock in a late lecture on the relation of insects and flowers leads to the inference that in his opinion the brilliancy of colour rather than the odour is the attraction. My observations lead me to suppose that it is not the colour, but the particular odour of each variety or species of flower which induces the visit. With great interest, not unmixed with curiosity, I have observed (my attention was at first casually excited) that bees particularly, and also butterflies, visit a distinct variety and for the time confine their attention to it, settling on and sucking the honey of that variety only; *e.g.*, a bee settling on a scarlet geranium will not go from it to another species or variety, but gives its attention to the particular variety only, irrespective of colour, whether scarlet, pink, or white, never going from a scarlet geranium to another scarlet flower, even if in contact. Whatever the species of flower, it is the same—pelargoniums, petunias, heliotropes, lilies, &c. The visit is from pelargonium to pelargonium, not from pelargonium to geranium (both cranes bills), and from lily to lily, irrespective of colour. I never remarked a bee go from a lily to an amaryllis, or the reverse. The object of this distinctive selection appears to be fertilisation. The indiscriminate admixture of the pollens of distinct varieties would probably frustrate the ends of nature and lead to monstrosities or barrenness. What would be the effect of the admixture on its own stores is a distinct question. So far as the insect is concerned, doubtless the fact has relation to its own economy. Whatever be the reason, there appears to be the harmonious adjustment of two facts under the relations of one law. If the colour, and not the odour, was the attraction, the visits would be indiscriminately made to all flowers of a brilliant hue. The observation of the lecturer as to flies being attracted by stinking plants or carrion seems to prove the fact suggested. Flies settle indiscriminately on all putrefactions, and will go immediately from a flower to offal or from offal to a flower. With bees and butterflies there is certainly a discriminative selection guided by odour; I have also remarked that some flowers are rarely, if ever, visited by bees.

I have never in the books I have read met with this observation, and when so acute and distinguished an observer as Sir John Lubbock passes over the circumstance, I presume either the fact has not been observed, or, if observed, has been considered to be inconsequential. The observation may be worth nothing, but in these days of *minute science*, when every infinitesimal variation is noticed and invested with importance, there may be a significance in the fact which escapes me, but which, with others, may have its value. So far as I know, the occurrence is invariable; being so, the inference is that odour, and not colour, is the attraction. I have called the attention of others to the occurrence, who have, watching the results, always come to the same conclusion as myself. S. B.

OUR ASTRONOMICAL COLUMN

THE NEBULA, MESSIER 8 (G.C. 4361).—Dr. Tempel draws attention to the different appearance presented by this large nebula at the present time from that depicted in Sir J. Herschel's drawing made at the Cape of Good Hope in 1836-37, which he considers can only be explained on the assumption of a shifting of the whole nebula with respect to the stars by reference to which it was delineated at the Cape, or by great changes in the nebula itself. The case will be worthy of attention, because it appears Sir J. Herschel's drawing was made with much care, as he says "every attention has been paid to exactness." The whole area occupied by the nebula, so far as he could trace its convolutions, is stated to be about one-fifth of a square degree. The relative positions of the stars in and near it, to the number of 186, were ascertained by differential observations with 9 Sagittarii; "from these measures skeleton charts were then constructed, and being divided into convenient triangles, the nebula was worked in upon them." A drawing made under these circumstances might certainly be expected to represent its actual features, and it appears to be given with confidence by Sir J. Herschel. Dr. Tempel, observing with the large Amici-telescope at Arcetri, near Florence, finds that the reference stars entered in the Cape drawing are still as they then were, with some insignificant variations of position or brightness; but the difference of the details of the nebula as projected on these stars, from those shown by Sir J. Herschel, are so marked as to leave, in Dr. Tempel's opinion, no other explanation than is suggested above. Prof. Schiaparelli, to whom Dr. Tempel had forwarded his own delineation of the nebula for comparison with that made at the Cape, remarks, after twice examining it:—"Je dirai tout-de-suite, qu'il m'aurait été impossible de reconnaître la nébuleuse avec le seul dessin de J. Herschel." The nebula is figured on Plate I. in the Cape observations; the description will be found at p. 14. Probably Mr. Ellery, who, as was stated last week, is still occupied with new drawings of Sir J. Herschel's figured nebulæ, may be able to express an authoritative opinion with respect to the supposed changes in this object.

THE BINARY STAR *a* CENTAURI.—It appears from the supplementary number of the *Monthly Notices* of the Royal Astronomical Society that this star has not been neglected during the critical portion of its orbit at the observatory at Sydney. Mr. H. C. Russell, the director, publishes measures taken in each of the years 1870-77, excepting 1875, when he was in Europe, and expresses his intention to observe it accurately during the next few months, that the true time of the periastre, &c., may be determined. The later measures indicate the necessity of a correction for bias, the observer getting sensibly differing angles of position according as the telescope was east or west of the pier—in which, by the way, he is not singular; the amount of the necessary correction was to be investigated. It is very satisfactory to find that a sufficient number of measures of this grand binary system, for obtaining pretty good elements of its motion, are likely to be put upon record at the present periastre. The next we know will not occur until the middle of the ensuing century.

JUPITER'S SATELLITES.—On October 8, M. Yvon Villarceau laid before the Paris Academy of Sciences a memoir, by M. Glasenapp, on the satellites of Jupiter which appears to have been forwarded in competition for the *Prix Damoiseau*, and which had been found amongst the papers of M. Leverrier, one of the commission to whom the adjudication of the prize had been referred. It is known that M. Glasenapp has been occupied for some time past at Pulkowa upon investigations connected with these bodies.

THE PRESENT COMETS.—The comet discovered by M. Coggia on September 14, though faint, is still well situated for observation in the morning sky. The following elements calculated by Herr E. Hartwig, from observations on September 14, 18, and October 6 have been received from Prof. Winnecke:—

Perihelion passage September 10·7566 M.T. at Berlin.

Longitude of perihelion	108° 10′ 57″	M.Eq.
,, ,, ascending node ...	251 3 52	1877·0.
Inclination	77 51 6	
Log. perihelion distance	0·197506	

Motion—retrograde.

Hence the following positions for Berlin midnight:—

	R.A.	N.P.D.	Distance from the earth.	Distance from the sun.
	h. m.	° ′		
Oct. 19 ...	7 39·8 ...	54 3 ...	1·234 ...	1·662
,, 23 ...	7 28·1 ...	56 16 ...	1·166 ...	1·680
,, 27 ...	7 14·9 ...	58 48 ...	1·102 ...	1·699
,, 31 ...	7 0·0 ...	61 42 ...	1·044 ...	1·720
Nov. 4 ...	6 43·5 ...	65 3 ...	0·994 ...	1·743
,, 8 ...	6 25·6 ...	68 49 ...	0·953 ...	1·766

Of the comet discovered by Dr. Tempel at the Observatory of Arcetri, near Florence, on October 2, the following elements by Dr. Schur are also from Prof. Winnecke :—

Perihelion passage June 27·970 M.T. at Berlin.

Longitude of perihelion	83° 30′0
,, ,, ascending node	184 17·8
Inclination	64 54·2
Log. perihelion distance	0·00994

Motion—retrograde.

On June 28 the comet was in R.A. 5h. 51m., N.P.D. 34°·4, distant from the earth 1·71; on August 1 in R.A. 4h. 47m., N.P.D. 38°·8, distance 1·35 ; and on September 3 in R.A. 2h. 36m., N.P.D. 55°·4, distance 0·79, so that an earlier discovery might have been expected.

The places subjoined are from these elements for 12h. G.M.T. :—

		R.A. h.	m.	N.P.D. °	′	Distance from the Earth.	Distance from the Sun.
Oct.	18	23	5·5	112	54	1·241	2·036
,,	20	23	2·0	113	48		
,,	22	22	58·9	114	37	1·350	2·084
,,	24	22	56·0	115	20		
,,	26	22	53·5	115	58	1·462	2·132
,,	28	22	51·3	116	31		
,,	30	22	49·4	117	2	1·577	2·180
Nov.	1	22	47·7	117	29		
,,	3	22	46·3	117	54	1·695	2·227

BIOLOGICAL NOTES

BORING POWER OF MAGILUS.—We have received from Mr. Charlesworth a preliminary note giving briefly a result of his study of the genus Magilus, the remarkable testaceous gasteropod that is found immersed in the large hemispherical corals of the genus Meandrina. The current belief, as set forth by Sowerby, Owen, Woodward, and other authorities in molluscan biology who have treated of this coral-inhabiting mollusc, is that Magilus in its young state effects a lodgment in a crevice of a Meandrina, and that as the coral enlarges, the Magilus extends the margins of the mouth of its shell in the form of a cylindrical corrugated tube, the growth of this tube and of the coral proceeding together *pari passu*, and consequently that there is no penetration of the coral by the Magilus at all. Mr. Charlesworth, however, finds that Magilus not only drives through solid masses of coral in any direction with apparently the same facility that the bivalve Teredo tunnels masses of wood, but he finds that it even surpasses Teredo in its power of suddenly reflecting its shell and returning to the point from which it commenced its advance ; and this bending back of the shell upon itself is not accomplished in such natural cavities as frequently prevail in large corals of the Meandrina genus, but in the solid mass of the coral.

GREAT VITALITY OF ANTS.—Several interesting observations have been made by the Rev. H. C. McCook on the endurance of extremes of heat and cold by ants. This year a formicary of *F. pennsylvanica* was cut from an oak bough and exposed out of doors to the rigour of a mountain winter, and survived. A number were dropped separately upon ice, and were found alive after forty-eight hours, each in a little depression. *F. rufa* was found active in its formicary at 34° F., sluggish at 30°. The extreme of heat seemed also to be endured by *F. pennsylvanica;* they did not suffer at all from the heat of stones walling in a camp fire, having been driven into this position out of a burning stump. A community of agricultural ants (*M. molefaciens*) lived in a mound upon which some smiths in Texas made their fires for heating waggon tires. Numbers of ants were seen at work by Dr. Lincecum, cleaning out the entrance to their city, before the entire extinction of the fire just used for heating tires. They had learnt all about the fire, and knew how to work in and around the dying embers without injury. A quantity of mason ants (variety of *F. rufa*) observed by Mr. McCook were accidentally flooded under five inches of water, and they appeared to be quite dead, and floated about in this condition for many hours. But subsequently most of them recovered full activity. In Texas Mr. Lincecum found that the agricultural ants are seen in great numbers in wells, forming a sort of floating mass as large as an orange, clinging together. In this condition they get drawn up in the bucket, and though they may have been in the water a day or two, they are all found alive. Yet individuals cannot survive under water more than six minutes ; and life in these balls can only be preserved by the mass revolving, either by the continued struggles of the individual insects, or by an instinctive and orderly movement of the outer tier of ants (*Proc* Acad. Nat. Sci. Philadelphia, 1877, p. 134).

THE STRIPED MULLET.—This fish, so abundant off the coast of North Carolina, seems to suffer from several serious drawbacks, which would appear to threaten its extinction. It moves through the water so slowly that a man may easily walk as fast. The young fry suffer from a disease which gradually destroys the sight, and great numbers perish ; they are also much infested with parasitic worms. To counterbalance these destructive agencies, the female has an enormously distended roe.

THE MEDITERRANEAN FLORA.—From personal observations in Italy and Greece, with the aid of literature bearing on the subject, M. Fuchs comes to the conclusion that the so-called Mediterranean flora, so far as represented by evergreen woody plants, and plants of the sage, thyme, lavender, and rosemary order therewith always associated, occurs, at least in France, Italy, Greece, Southern Russia, and Northern Asia Minor, exclusively on calcareous formations, while soils with little or no lime (granite, gneiss, flysch, sandy and muddy alluvia of rivers) in the whole of that region, and south to Sicily and Morea, bear exclusively deciduous foliaceous trees, and in general, a vegetation hardly differing from the ordinary central European flora. We are not, however (M. Fuchs says), to conceive the phenomenon as if the former class of plants required the lime as nutriment; the correct view rather is, that the southern evergreen flora is better able to press northwards on the drier and warmer calcareous formation, than on the damper and colder clayey soil. And he finds support of this view in the fact that, in the Azores, Madeira, and the Canary Islands, with a truly subtropical climate, an evergreen shrub vegetation closely agreeing with the Mediterranean flora flourishes on various soils indifferently, even on basaltic and trachytic rocks. The same appears to be the case in Algiers.

FOX TALBOT

HAD the photographic art never been invented, Mr. W. H. Fox Talbot, whose death we recently recorded, would have a claim to take a good rank as a scientific investigator. In the popular estimation his work in connection with photography is what alone gives him a claim to remembrance ; but we are sure there are many of our readers who must be familiar with writings by him in various departments of science. He was indeed in many respects a wonderful man, and a glance at the Royal Society Catalogue will show that he has left behind him a great amount of varied work. In mathematics, in physics, in chemistry, in astronomy, in botany, in archæology, in literature, Fox Talbot at various periods of his life did substantial work, and in addition filled faithfully and liberally the responsible position of an English country gentleman on his estate of Lacock Abbey, Wiltshire.

Fox Talbot was the eldest son of Mr. William Davenport Talbot, his mother being a daughter of the Earl of Ilchester. He was born in February, 1800, and received his early